

# PATENT COOPERATION TREATY

# PCT

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference WPP91451		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/US2004/018286		International filing date (day/month/year) 09.06.2004	Priority date (day/month/year) 09.06.2003	
International Patent Classification (IPC) or national classification and IPC C08C19/44, C08C19/30, C08L19/00				
Applicant BRIDGESTONE CORPORATION				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  06.01.2005		Date of completion of this report  10.08.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer  Denis, C Telephone No. +31 70 340-		



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/US2004/018286

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
    - ☐ international search (under Rules 12.3 and 23.1(b))
    - ☐ publication of the international application (under Rule 12.4)
    - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

### Description, Pages

1-29 as originally filed

### Claims, Numbers

1-10 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
    - ☐ the description, pages
    - ☐ the claims, Nos.
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing (*specify*):
    - ☐ any table(s) related to sequence listing (*specify*):
  4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
    - ☐ the description, pages
    - ☐ the claims, Nos.
    - ☐ the drawings, sheets/figs
    - ☐ the sequence listing (*specify*):
    - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/018286

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	8,9,10
	No: Claims	1-7
Inventive step (IS)	Yes: Claims	9,10
	No: Claims	1-8
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

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**Box No. VI Certain documents cited**

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1. Certain published documents (Rule 70.10)

and /or

2. Non-written disclosures (Rule 70.9)

**see separate sheet**

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/US2004/018286

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	8,9,10
	No: Claims	1-7
Inventive step (IS)	Yes: Claims	9,10
	No: Claims	1-8
Industrial applicability (IA)	Yes: Claims	1-10
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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**Box No. VI Certain documents cited**

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**1. Certain published documents (Rule 70.10)**

and / or

**2. Non-written disclosures (Rule 70.9)**

**see separate sheet**

**Re Item V.**

The following documents are referred in this communication; the numbering will be adhered to in the rest of the procedure:

D2: US-A-4 927 887

D3: WO-A-03/046020 (with passages of EP-A-1 449 857)

**Novelty (Article 33(2) PCT:**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 to 7 is not new in the sense of Article 33(2) PCT.

Document D2 discloses a rubber compositions for tires comprising fillers (silica and/or carbon black) and a polymer comprising end-functionalising groups (column 8 lines 46 to 60). The functionalised polymer is prepared by anionically polymerising 1,3-butadiene and styrene in presence of butyl lithium (column 3 lines 52 to 64 and example 1). The living polymer is then first reacted with 2-vinyl pyridine (which correspond to a functionalising agent X' listed in claim 5 of the present application) followed by the addition of benzyl chloride as a second functionalising agent Y' (column 2 lines 31 to 40 and example 3). However, document D2 differs from claims 8 to 10 of the present application in that the second modifying agent Y' is not one of the components listed in claim 8 and in that Y' does not comprise a short-chain polymer group. Moreover the process of D2 does not involve the use of a chain-extending group Z as suggested in claim 10 of the present application.

The subject-matter of claims 1 to 5 and 7 is therefore not novel in view of D2.

Document D3 relates to a process for producing a functionalised conjugated diene based polymer. The process involves the preparation of a living polymer having active chain ends, reacting the active sites with a hydrocarbyloxysilane compound (I) (page 5 lines 19 to 35) and reacting the modified polymer with a second hydrocarbyloxysilane (II) and/or (III) (page 7 line 56 to page 8 line 16). Compound (I) may be 3-glycidoxypropyltrimethoxysilane (page 6 line 3) and compound (III) may be cyanomethyltrimethoxysilane (page 8 lines 32 and 33). Document D3 discloses a vulcanisate comprising silica and/or carbon black and the functionalised polymer described above (page 11 lines 33 to 36).

Document D3 is prejudicial to novelty of the subject-matter of claims 2 to 7 (**product claims**) for the following reasons:

Claims 2 and 3 of the present application disclose a functionalised polymer that is defined in terms of the process by which the product is made (i.e. anionic polymerisation). Such claims (and depending claims 4 to 9) should be construed as a claim to the product (i.e. functionalised polymer) *per se* that possesses the characteristics derived from the manufacturing process stated in the claim (see Guidelines A5.26[1] PCT). Therefore, the patentability of a product defined by a product claim does not depend on its method of production. There are no special technical features of the resulting modified polymer in claim 2 that could distinguish the functionalised polymer of claim 2 (or claim 3) from other terminally functionalised polymers (such as microstructure, viscosity, ...). The vulcanisate of claim 2 and the functionalised polymer of claim 3 will therefore be regarded as a vulcanisate comprising a polymer having on its end two functional agents X and Y. Document D3 contains all these technical features (in terms of the product *per se*).

**Inventive step (Article 33(3) PCT):**

The subject-matter of claims 8 does not involve an inventive step for the following reasons:

Document D3 which is considered to represent the closest prior art over claim 8 discloses a vulcanisate comprising a polymer being first terminally modified by a hydrocarbyloxysilane compound (I) (page 5 lines 19 to 35) and a second hydrocarbyloxysilane (II) and/or (III) (page 7 line 56 to page 8 line 16). Compound (I) may be 3-glycidoxypropyltrimethoxysilane (page 6 line 3) and compound (III) may be cyanomethyltrimethoxysilane (page 8 lines 32 and 33).

Claim 8 of the present application differs from document D3 in that the second functionalising agent is a cyanopropyltrimethoxysilane.

There are no demonstrated effects on file with regard to this special technical feature. Replacing the **methylene** radical of the compound of D3 by a **propylene** radical as suggested in claim 8 cannot be considered as involving an inventive step. Knowing document D3, and seeking to provide an alternative terminally functionalised polymer, the skilled man would consider as a normal design to react the modified polymer with cyanopropyltrimethoxysilane instead of cyanomethyltrimethoxysilane.

The subject-matter of claim 8 is not inventive.

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

International application No.

PCT/US2004/018286

However, none of the cited prior art discloses the use of a functionalising agent comprising a short-chain polymer group nor the use of a chain-extending group Z. The subject-matter of claims 9 and 10 are therefore inventive.